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REMARKS/ARGUMENTS

General Remarks

Newly introduced claims 36-53 are pending in this application.

In the Final Office Action mailed March 15, 2006, the previous set of claims was rejected under 35 U.S.C §103(a) over Santiago *et al.* (U.S. Patent Publication 2002-0186661), and claim 9 was rejected under 35 USC §103(a) over Santiago in view of Fichou (U.S. Patent 6,072,772).

The Fichou reference

The Fichou reference applies to claim 9 which relates to policing according to "a burst-tolerance guarantee". Claim 9 has been cancelled, and none of the pending claims in this amendment refers to a burst-tolerance guarantee.

Thus, the examiner's rejection over Santiago in view of Fichou has been overcome.

The Santiago reference

Santiago discloses a system for policing flows and subflows of a data stream. The number of flows is arbitrary and any flow may comprise an arbitrary number of subflows. All flows are individually metered (policed) and where necessary the subflows of a flow may be individually policed.   Santiago uses a variety of credit-token methods, including the popular leaky-bucket method used in the present invention. As such, Santiago addresses the same problem addressed in the present invention and uses the same (credit based) policing element used in the present invention. However, Applicant respectfully submits that the method of the present invention is distinctly different from the method of Santiago as will be described below. Regarding terminology, Applicant notes that the term "subflow" in Santiago corresponds to 'traffic class" in the present application.

Santiago uses a hierarchical policing system which meters each flow. Under

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certain conditions, subflows – if any – of a metered flow may not be considered.
Under other conditions, the subflows are metered and packets of any offending
subflow are marked as nonconforming.

The hierarchical policing approach is prevalent in many embodiments in
Santiago; see for example FIG. 11 and paragraph [0077] in Santiago:

> "Each of the flows may be individually metered 1102, and collectively
> is bounded by the contracted bandwidth or quality of service (QoS). At
> some point, bandwidth levels (e.g., credit levels) used for policing flows
> may fall below a threshold level, as determined at decision block 1104.
> If the bandwidth levels have not exceeded this threshold, **the flows
> may continue to be metered 1102 without regard to individual
> subflow metering, and all packets in that flow will receive the
> same drop probability.** However, if the bandwidth exceeds the
> threshold as determined at decision block 1104, **subflows of a
> particular one or more flows may be metered** as shown at block
> 1106."

The present invention

The present invention provides a policing method and an apparatus
which consider all traffic classes of a service (corresponding to all subflows of a flow
in Santiago). The traffic classes are considered in a sequential order and policing
(metering) each traffic class, except the first, is based on (1) a cumulative service-
rate allocations of all traffic classes preceding and including said each traffic class,
(2) arriving packets of said each traffic class, and (3) all accepted packets (packets
marked as "conforming") of the traffic classes preceding said each traffic class. The
objective is to distribute unused capacity allocations in an orderly manner. No such
feature is described, or implied, in Santiago. The method is implemented by means
of cascaded policing devices.

The policing method of the invention increases the utilization of a
communications link shared by multiple traffic classes. The method permits
harmless trespassing of packets belonging to a traffic class into capacity
committed for another traffic class on a packet-by-packet basis without violating any
capacity-allocation agreements. This means that a packet of a traffic-class X may
use the capacity allocation of a traffic-class Y only if traffic-class Y has no waiting

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packets and a subsequent packet of traffic-class X may be denied the use of the
capacity allocation of traffic-class Y. The capacity allocations of the two classes (X
and Y) remain unchanged. No such feature is described, or implied, in the Santiago
reference. New claims 36-53 focus on the feature of allowing packets of a traffic
class to use capacity allocated to another class under certain conditions. For
example, claim 36 recites:

> "identifying conforming packets of each successive traffic class based on:
>
>> a combination of arriving packets of said each successive traffic class
>> and conforming packets of all preceding traffic classes; and
>>
>> a sum of committed information rates of all preceding traffic classes
>> and a committed information rate of said each successive traffic class."

Thus, each traffic class (each flow) is allocated a guaranteed information rate,
but the policing apparatus provides further flexibility as long as it is not to the
detriment of any traffic class.

Thus, in view of the currently introduced amendments and arguments
presented above, the Examiner's rejections over Santiago reference have been
overcome.

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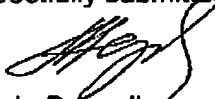Response to office action dated September 28, 2006

Conclusion

New claims 36-53 have been introduced to clearly define the invention.
No new matter has been added.

In view of the presented arguments, a favorable consideration and
allowance of claims 36-53 of the application is earnestly solicited.

Respectfully submitted,

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